TIERRA SOLUTIONS, INC. SM

Transmitted Via **Electronic Mail**

December 18, 2014

Ms. Alice Yeh:
Remedial Project Manager
U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866

Re: Combined Sewer Overflow/Stormwater Outfall Investigation Phase I Total TCDD Verification

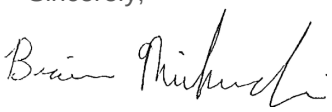
Dear Ms. Yeh:

In accordance with Worksheet #36 of the Combined Sewer Overflow/Stormwater Outfall (CSO/SWO) Investigation Quality Assurance Project Plan (QAPP) Revision 3, September 2013, please find enclosed a memorandum from Environmental Data Services documenting the verification of total TCDD values reported during Phase I.

By submittal of this memorandum and data, Tierra is not subscribing to the usefulness of the estimated Total TCCD value for reasons previously discussed and presented to USEPA.

If you have any questions, please feel free to contact me at (732)-246-5920

Sincerely,



Brian Mikucki

Environmental Scientist
On behalf of Occidental Chemical Corporation
(as successor to Diamond Shamrock Chemicals Company)

Enclosures

Cc: Paul Brzozowski, Tierra Solutions Inc.
Clifford Firstenberg, Tierra Solutions Inc.
Diane Waldschmidt, Environmental Data Services, Ltd.
Alain Hebert, ARCADIS
Meredith Hayes, ARCADIS

ENVIRONMENTAL DATA SERVICES, LTD.

To: Brian Mikucki, Tierra Solutions, Inc.
Two Tower Center Boulevard Floor 10
East Brunswick, New Jersey 08816

From: Diane Waldschmidt, Environmental Data Services, Ltd. (EDS)

Date: November 11, 2014

Re: Verification of Total Tetrachlorinated Dibenzo-*p*-dioxin Results Reported for Phase I of Tierra's Combined Sewer Overflow/Stormwater Outfall Investigation (CSO/SWO)

Objective:

The purpose of this technical memorandum is to summarize EDS's findings upon completion of verification of total tetrachlorinated dibenzo-*p*-dioxin (TCDD) results reported for the investigation described above.

Procedure:

The verification procedure utilized in completing this task has been included as Attachment A of this memorandum. This verification procedure was implemented as an evaluation of TCDD results since these values were not evaluated during the isomer specific data validation task. This process is used to assess both the completeness and accuracy of the TCDD data set.

Total TCDD results were verified for each sample having total TCDD results reported in Phase I of the CSO/SWO Investigation. In cases where multiple analyses were performed by the laboratory for 2,3,7,8-TCDD (example: multiple dilutions due to elevated target analyte concentrations or re-analysis based on failed quality control criteria), EDS staff made certain that the total TCDD value reported in the data base, as well as hardcopy data, was based on the same analysis used to derive the 2,3,7,8-TCDD value reported.

Note: Although results for other total dibenzo-*p*-dioxins (chlorination levels penta, hexa, and hepta) as well as dibenzo furans (chlorination levels tetra through hepta) reside in the existing database, they have not been reviewed using the attached procedure, nor have they been checked for potential transcription error.

Results of Verification:

All 53 total TCDD results, reported during implementation of the CSO/SWO Investigation, were evaluated during this task. Of the 53 samples evaluated for this program, four of the results are recommended for editing based on the results of the total TCDD result verification task. The affected samples and associated results are provided in the Table 1 below. Total TCDD results for these samples have been corrected in both the laboratory hardcopy data reports and United States Environmental Protection Agency (USEPA) Region 2 Main Electronic Data Deliverable (MEDD).

Table 1

Sample Identification	Result Units	Original Result Value	Data Qualifiers	Corrected Result Value	Data Qualifiers
PR1LPDUP-01A	pg/g	11.5	EMPC	9.72	EMPC
PR1CSOCLYHP-02B	pg/g	14.0		12.8	
PR1HPDUP-02B	pg/g	13.8	EMPC	12.1	EMPC
PR1CSOCLYHP-01C	pg/g	19.4	EMPC	17.8	EMPC

EMPC = estimated maximum possible concentration
pg/g = picograms per gram

Attachment A

VALIDATION SOP

Total Tetra-Chlorinated Dibenzodioxin
Verification of Total Tetra-Chlorinated Dibenzodioxin Results
Rev. 1, 10/04/06
Diane Waldschmidt

Title: Procedure for Verification of Total Tetra Chlorinated Dibenzo Dioxin Results - Rev. 1

Author: Diane Waldschmidt

Date: 10/04/06

Purpose: The purpose of this procedure is to provide the basis for evaluation of Total Tetra Chlorinated Dibenzo Dioxin (TCDD) results. These values are not evaluated during the isomer specific data validation task. Therefore this procedure has been developed to define the process used to assess completeness and accuracy of the TCDD data set.

Limitations: This procedure was developed based on the fact that the 2,3,7,8 – substituted isomer specific data validation has already been performed. Therefore quality control criteria previously evaluated are not covered in this procedure (ex. holding time compliance, review of field chain of custody records, etc). This procedure alone is inadequate for data verification.

Procedure:

1. Verify that all necessary raw data are present to support the Total TCDD result reported.

   Are selected ion current profiles (SICPs) for ions 319.8965 and 321.8936 representing all non 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxins and 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxin reported for each sample in the delivery group present in the data package?

   Yes No NA

   Are integrated areas present for both the primary and confirmation ions for all peaks 2.5 times above background noise in each sample SICP?

   Yes No NA

   Are instrument quantitation reports containing relative response factors for 2,3,7,8-TCDD, area counts for the 2,3,7,8 –TCDD labeled analog and sample preparation information present for each sample in the delivery group?

   Yes No NA

   If any of the required deliverables are missing, contact the laboratory project manager to request explanation/resubmittals.

2. Verification of Total TCDD results reported for each sample.

Is the retention time of each non 2,3,7,8-substituted compound identified as present in the sample within the window established by the window defining mixture, for the tetra chlorinated homologue?

Yes No NA

Is the integrated ion current of each non 2,3,7,8-substituted compound identified as present in the sample at least 2.5 times background noise?

Yes No NA

Are all peaks meeting the requirements described above included in the laboratory's calculation of Total TCDD?

Yes No NA

Choose a minimum of one non 2,3,7,8-substituted compound identified and verify by recalculation the concentration found using the integrated area responses of the two characteristic ions identified on the SICP and the following equation:

$$\frac{(\text{area of analyte}^{1})(\text{labeled analog [ng]}^{2})}{(\text{RRF}^{3})(\text{area of labeled 2,3,7,8-TCDD}^{1})(\text{sample extracted [g]})}$$

[1] Combined area of M1 and M2 ions
[2] amount of labeled 2,3,7,8-TCDD in extract
[3] RRF for 2,3,7,8-TCDD native

Calculate the sum of all non 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxins and 2,3,7,8-substituted tetra chlorinated dibenzo-p-dioxin identified in each sample. Compare result obtained with that found on the Form 1.

Were any errors found?

Yes No NA

If any errors are found, contact the laboratory project manager to request explanation/resubmittals.